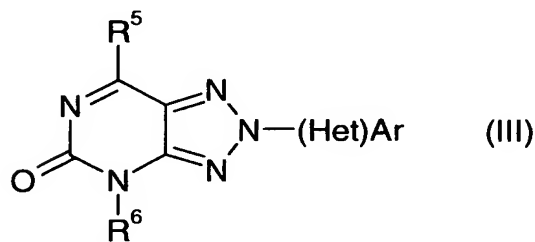
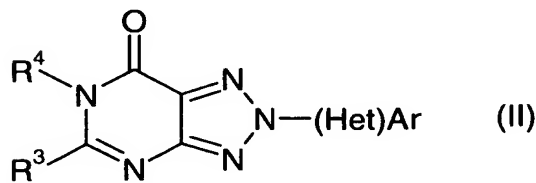
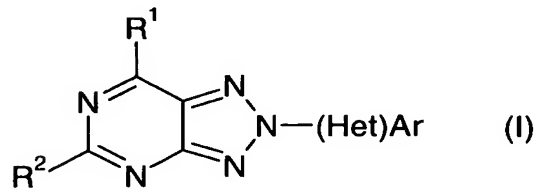


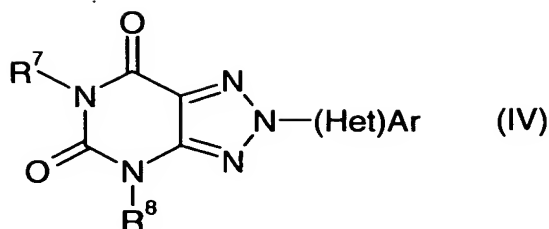
As enclosed to IPRP

Claims

- 5 1. The use of triazole derivatives selected from the group consisting of triazolopyrimidine derivatives and triazolouracil derivatives in organic light-emitting diodes.
2. The use according to claim 1, wherein the triazole derivatives are used as emitter molecules.
- 10 3. The use according to claim 1, wherein the triazole derivatives are used as host molecules in the emitter layer.
- 15 4. The use according to any of claims 1 to 3, wherein the triazole derivatives are selected from among compounds of the structural formulae I, II, III or IV:



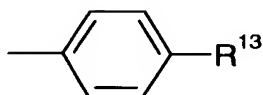
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where the symbols have the following meanings:

- 5 R^1, R^2 are each, independently of one another, H, alkyl, aryl, heteroaryl, OH, O-alkyl, O-aryl, halogen or amino, with at least one of the substituents R^1 or R^2 being OH, O-alkyl, O-aryl, halogen or amino;
- R^3, R^5 are each, independently of one another, H, alkyl, aryl, heteroaryl, OH, O-alkyl, O-aryl, halogen or amino;
- 10 R^4, R^6, R^7, R^8 are each, independently of one another, H, alkyl, aryl or heteroaryl; or
- R^3 and R^4 together with the atoms to which they are bound form a 4- to 8-membered ring which may contain further heteroatoms and is saturated or unsaturated and unsubstituted or substituted;
- 15 (Het)Ar is aryl or heteroaryl.

5. The use according to claim 4, wherein the radical (Het)Ar is a radical of the formula



20

where

- R^{13} is H, alkyl, O-alkyl, S-alkyl, aryl, O-aryl, S-aryl or alkenylaryl, preferably H, OCH₃, phenyl which may be substituted or
- 25 unsubstituted or styryl which is unsubstituted.

6. The use according to claim 4 or 5, wherein, in the triazole derivatives of the formula I

- 30 R^1 is Cl, OH, OCH₃, OPh or morpholino, preferably OH, OCH₃, Cl or morpholino, particularly preferably Cl or morpholino;

and/or

R^2 is OH, OCH₃, OPh, piperidino, pyrrolidino, morpholino or N(CH₃)₂, preferably OH, N(CH₃)₂, piperidino, pyrrolidino or morpholino, particularly preferably N(CH₃)₂.

5

7. The use according to claim 4 or 5, wherein, in the triazole derivatives of the formula II or III,

10 R^3, R^5 are each, independently of one another, OH, OCH₃, OPh, piperidino, pyrrolidino, morpholino or N(CH₃)₂, preferably OH, N(CH₃)₂, piperidino, pyrrolidino or morpholino, more preferably piperidino, pyrrolidino or morpholino;

and/or

15 R^4, R^6 are each, independently of one another, H, CH₃ or phenyl, preferably H.

8. The use according to claim 4 or 5, wherein, in the triazole derivatives of the formula II,

20 R^3 and R^4 together with the atoms to which they are bound form a 5- to 7-membered ring which may contain further heteroatoms, preferably selected from among S, N and O, particularly preferably a further N atom, and is saturated or unsaturated, preferably saturated, and is unsubstituted or substituted; the ring particularly preferably has a substituent selected from among alkyl and aryl on the further N atom while the remaining atoms of the ring are unsubstituted.

25

9. The use according to claim 4 or 5, wherein, in the triazole derivatives of the formula IV

30 R^7 and R^8 are each, independently of one another, H, CH₃ or phenyl, preferably CH₃.

10. An organic, light-emitting diode comprising at least one triazole derivative according to any of claims 1 to 9.

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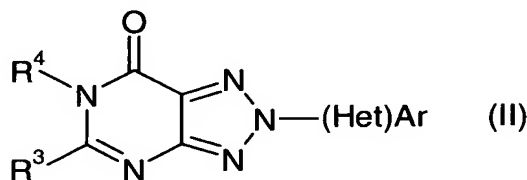
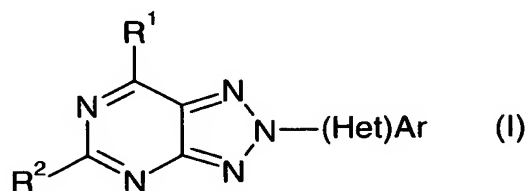
11. A light-emitting layer comprising at least one triazole derivative according to any of claims 1 to 9.

12. An organic light-emitting diode comprising a light-emitting layer according to claim 11.

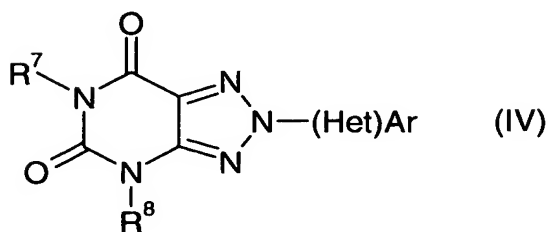
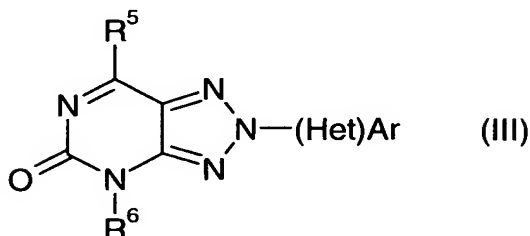
5 13. A device selected from the group consisting of stationary VDUs such as VDUs of computers, televisions, VDUs in printers, kitchen appliances and advertising signs, lighting, information signs and mobile VDUs such as VDUs in mobile telephones, laptops, vehicles and destination displays on buses and trains comprising an OLED according to claim 10 or 12.

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14. A triazole derivative of the general formula I, II, III or IV



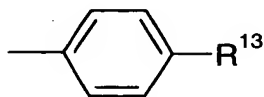
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in which the symbols have the following meanings:

- 5 R^1 is halogen, preferably Cl, or a cyclic amino group, particularly preferably morpholino;
- R^2 is dimethylamino;
- 10 R^3, R^5 are each, independently of one another, amino, preferably dimethylamino or a cyclic amino group, particularly preferably morpholino, pyrrolidino or piperidino;
- R^4, R^6 are each, independently of one another, H, alkyl, aryl or heteroaryl, preferably H;
- 15 R^7, R^8 are each, independently of one another, H, alkyl, aryl, with R^7 and R^8 not both being H, preferably alkyl, particularly preferably methyl;
- or
- 20 R^3 and R^4 together with the atoms to which they are bound form a 5- to 7-membered ring which may contain further heteroatoms, preferably selected from among S, N and O, particularly preferably a further N atom, and is saturated or unsaturated, preferably saturated, and is unsubstituted or substituted; the ring particularly preferably has a substituent selected from among alkyl and aryl on the further N atom while the remaining atoms of the ring are unsubstituted;
- 25 (Het)Ar is a radical of the formula



30

where

- 35 R^{13} is H, alkyl, O-alkyl, S-alkyl, aryl, O-aryl, S-aryl or alkenylaryl, preferably O-alkyl, O-phenyl, phenyl which may be substituted or unsubstituted or styryl which is unsubstituted, particularly

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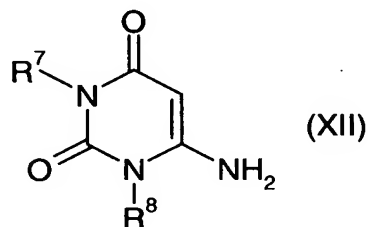
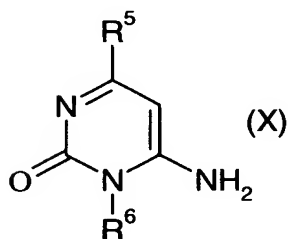
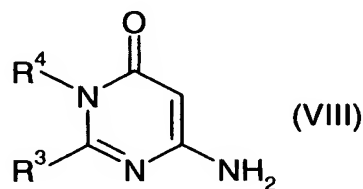
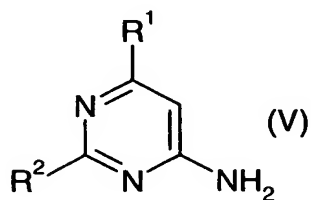
preferably O-alkyl or phenyl which is unsubstituted, very particularly preferably in the compounds of the formulae I, II or III O-CH₃ or in the compounds of the formula IV O-CH₃ or unsubstituted phenyl.

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15. A process for preparing triazole derivatives of the general formulae I, II, III and IV according to claim 14, which comprises the steps:

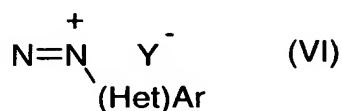
- a) coupling of an amine of the formula V, VIII, X or XII

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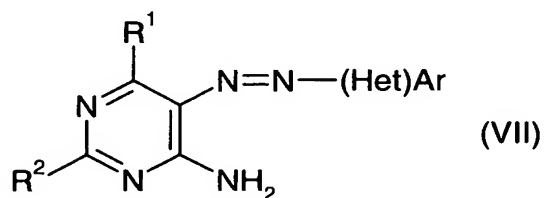
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with a diazonium salt of the formula VI

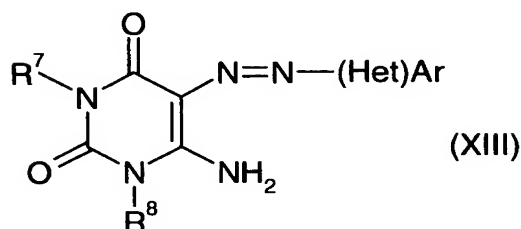
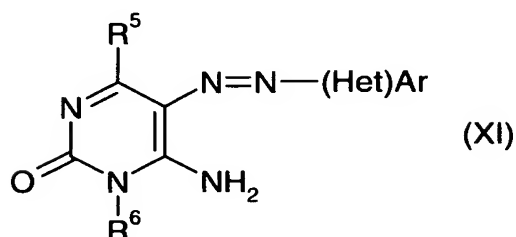
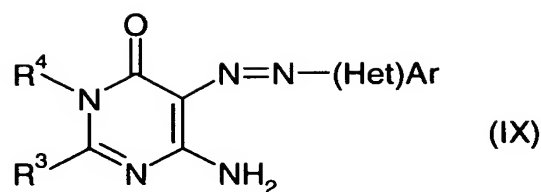


to give an azo compound of the formula VII, IX, XI or XIII;

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7 41



5

and

- b) oxidative ring closure of the azo compound of the formula VII, IX, XI or XIII, to form the corresponding triazole derivative of the formula I, II, III or IV;

10

where the symbols have the following meanings:

R^1 is halogen, preferably Cl, or a cyclic amino group, particularly preferably morpholino;

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R^2 is dimethylamino;

R^3, R^5 are each, independently of one another, amino, preferably dimethylamino or a cyclic amino group, particularly preferably morpholino, pyrrolidino or piperidino;

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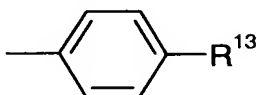
R^4, R^6 are each, independently of one another, H, alkyl, aryl or heteroaryl, preferably H;

R^7, R^8 are each, independently of one another, H, alkyl, aryl, with R^7 and R^8 not both being H, preferably alkyl, particularly preferably methyl;

5 or
 R^3 and R^4 together with the atoms to which they are bound form a 5- to 7-membered ring which may contain further heteroatoms, preferably selected from among S, N and O, particularly preferably a further N atom, and is saturated or unsaturated, preferably saturated, and is
 10 unsubstituted or substituted; the ring particularly preferably has a substituent selected from among alkyl and aryl on the further N atom while the remaining atoms of the ring are unsubstituted;

(Het)Ar is a radical of the formula

15



where

20 R^{13} is H, alkyl, O-alkyl, S-alkyl, aryl, O-aryl, S-aryl or alkenylaryl, preferably O-alkyl, O-phenyl, phenyl which may be substituted or unsubstituted or styryl which is unsubstituted, particularly preferably O-alkyl or phenyl which is unsubstituted, very particularly preferably in the compounds of the formulae I, II or III
 25 O-CH₃ or in the compounds of the formula IV O-CH₃ or unsubstituted phenyl;

and

30 Y^- is an anion, preferably a halide such as chloride or bromide, a sulfate ion or a tetrafluoroborate ion.